EXAMINER'S REMARKS

Claims 17-20 were rejected under 35 U.S.C. § 102(e) as being anticipated by USPN 5,940,435 to Hendrickson (hereinafter, Hendrickson). Claim 21 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

REMARKS

Claims 17-21 remain in this application.

A. Improper Final Action

The Status section of the Office Action Summary indicates this is a Final Action, since checkbox 2a is crossed out. However, Applicants believe this is not a Final Action, as the Hendrickson patent cited is a new basis of rejection. In a phone conversation with Examiner Bayard on 19 December 2002, it was confirmed that this Office Action is not a Final Action.

B. Claim rejections - 35 U.S.C. §102(e)

Claims 17-20 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hendrickson.

Hendrickson teaches a method for synchronizing a local symbol clock 220 to an incoming signal 157 consisting of a sequence of symbols. The symbol clock indicates the boundaries between the symbols in the incoming signal, and must be correctly aligned with the symbols, or else they will be decoded incorrectly (column 1, lines 38-44). Over time, the symbol clock will drift and occasionally may need correction. The symbol clock is corrected by adjusting the IF delay value of the symbol clock (column 9, lines

15-19). The IF delay value is determined by a symbol clock adjustment block 250 (column 9, lines 47-56; column 7, lines 58-62).

To determine whether the symbol clock needs correction, Hendrickson checks the quality of the decoded symbols from the complex signal 213, using a symbol quality detector 240. The symbol quality detector calculates the symbol quality signal 242 according to the equation

$$||I|-|Q||$$

where I and Q are the real and imaginary portions of the complex signal, respectively (column 10, lines 10-15). The quantity $||I|-|Q||$ is then compared to A, where A is the amplitude of the 4 signal-space points of the QPSK constellation. The further the quantity $||I|-|Q||$ is from A, the poorer the quality of the signal (column 10, lines 16-39). The symbol-clock adjustment block 250 analyzes $||I|-|Q||$. If $||I|-|Q||$ is too far off from A, this indicates that the symbol clock is no longer well synchronized with the data stream. The symbol-clock adjustment block 250 adjusts the IF delay value to bring the symbol clock back in sync (column 11, lines 4-20).

In distinct contrast to Hendrickson, the present invention teaches a power approximation circuit that avoids calculating squared terms by using an expectation function. First, the power approximation circuit calculates the sum $|I|+|Q|$ (Page 17, lines 11-22). Then, an expectation function is applied to that sum to produce an approximation for the power of the complex signal. The expectation function is an averaging function, which in one embodiment follows the equation:

$$\sqrt{\widetilde{N}_i} = a(|I|+|Q|)+(1-a)\sqrt{\widetilde{N}_{i-1}}$$

where a is an averaging constant between 0 and 1 (page 18, line 1). However, Hendrickson does not teach an expectation function. This unique and patentable feature can be found in claim 17 of the present invention: "... and then applying an expectation function to the combined absolute values".

It is argued in the Office Action that the expectation function of the present invention is functionally equivalent to the symbol clock adjustment block 250 of Hendrickson. Applicants respectfully disagree. The symbol clock adjustment block 250 does not perform any further calculations on the symbol quality signal $||I|-|Q||$. It only compares it to a known amplitude A, and then adjusts the IF delay of the symbol clock

accordingly. The output of the symbol clock adjustment block 250 is merely an updated IF delay, which is neither related to nor indicative of the power of the data signal. It only indicates how well the symbol clock is synchronized to the data signal. It does not generate a signal indicative of the power of the data signal, whereas the power approximation circuit of the present invention does. This unique and patentable feature can be found in claim 17 of the present invention: "... the power approximation circuit generating an approximate power value which indicates an actual power value for the complex signal... "

Independent claim 17 is believed to be allowable. Dependent claims 18-20 are believed to be allowable, based on the allowability of claim 17. No new matter has been introduced with this amendment. The rejections to claims 18-20 are believed to be overcome.

C. Claim objections

Claim 21 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As mentioned above in section A, independent claim 17 is believed to be allowable. Dependent claim 21 is also believed to be allowable, based on the allowability of claim 17. No new matter has been introduced with this amendment. The objection to claim 21 is believed to be overcome.

CONCLUSION

If the Examiner has any further questions or would like to discuss this application in more detail, he is invited to call the Applicants' agent at the telephone number given below. The Applicants respectfully suggest that the claims presently in the application are distinct over the prior art and that the application is now in condition for allowance. Accordingly, the Applicants solicit favorable action.

Respectfully submitted,
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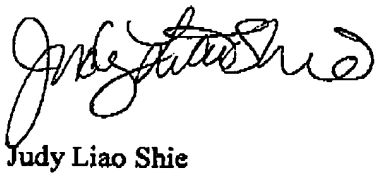

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